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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/471,460	12/22/99	FIGURA	T 94-0280.03

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MMC2/0731

EXAMINER

LEE, C

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 07/31/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/471,460

Applicant(s)  
FIGURA et al.

Examiner  
Calvin Lee

Art Unit  
2825



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on May 29, 2001 (Amendment C)
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 44-46 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 44-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirements.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some\* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 13
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

**OFFICE ACTION**

***Response to Amendment***

1. The cancellation of claims 20-22 in Amendment C filed on 5/29/01 is acknowledged. As the result of the claims cancellation, the provisional rejections in paper 12 are withdrawn.

***Substitute Specification required by Examiner***

2. A substitute specification including claims is required because there are punching holes.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 44 is rejected under 35 U.S.C. 102(b) as being anticipated by *Fujita et al.*

*Fujita* discloses a method of forming a storage node, comprising the steps of:

- sequentially depositing a conformal layer **18** of polysilicon (or metal) and a resist layer **22** of polymer within a contact **12** and over an insulator **14** (Figs. 2-4 and col. 3 lines 3-36)
- etching the resist layer except for a portion **22A** of the resist layer (Fig. 5 and col. 3, lines 25-26)
- etching a section of the conformal layer on the wafer surface with the use of the resist portion **22A** as a mask (Fig. 6 and col. 3, lines 38-41)
- removing the resist portion of the resist layer to expose conductive film **18** which has been left on the sidewall and the bottom of the recess (Fig. 7 and col. 3, line 42)

***Claim Rejections - 35 U.S.C. § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Fujita et al.* and *Imai et al.*

*Fujita* teaches all features of the invention (please see also page 1 of the Background), except for the teaching of etching the conductive layer simultaneously forming a polymer resist layer. Nevertheless, such polymerization is well known in the semiconductor processing art as evidenced by *Imai* disclosing a method of forming a polymer within a recess inside a single high density plasma chamber (Figs. 1, 10, and 16), comprising the steps of:

- introducing a feed gas of fluorocarbon to a wafer **X1** placed in a chamber **11b** that generates high-density plasma at low gas pressure (Fig. 1, col. 11 lines 57-67, and col. 12, line 16)
- forming a recess **7** by etching an insulator **1** using CHF<sub>3</sub>, CF<sub>4</sub>, ClF<sub>3</sub>, and CH<sub>2</sub>F<sub>2</sub> as the etchant gas simultaneously forming a polymer resist layer inside the recess (Figs. 2b and 3a, col. 12 line 26 through col. 13 line 25), whereas the thickness of the resist layer, which is controlled by the amount of the feed gas, is depended on the application (col. 13, lines 17-22)
- etching the resist layer out from the wafer surface using parameters known in the art (Figs. 3a-3b and col. 12, line 9)

It would have been obvious to one having ordinary skills in the art to have modified the cell formation of *Fujita* by utilizing a method taught by *Imai* --etching a layer simultaneously with performing a polymer deposition. The motivation to do so is to form a resist layer at the same time as to etch a conductive layer within a same chamber, thereby reducing processing time, cost, and damage to the treated wafer.

Therefore, the combination reference of *Imai* and *Fujita* teaches using a chamber of a plasma source to form a polymer resist layer out from the etching step.

***Response to Arguments***

7. Applicants' argument that Examiner "fails to meet the *prima facie* burden for at least three reasons such as the rejection based upon a misinterpretation of *Imai*, failure to consider the references as a whole, and no motivation to combine the cited references" is persuasive.

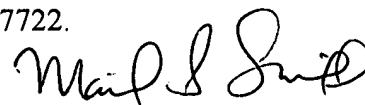
Examiner notes in the rejection above, that the specific portions of *Fujita* and *Imai*, relied upon by the Examiner to reject the claims, have been pointed out.

Therefore, Applicants' arguments are moot in light of the new rejection.

Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at 703-306-5854, Monday to Thursday, from 7 to 5 (Eastern Time). If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2825's Supervisory Patent Examiner *Matthew Smith* whose telephone number is 703-308-1323.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 or (703) 306-3329. The fax phone number for the Group is (703) 308-7722.

July 31, 2001



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